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wildlife and the countryside

WILDLIFE CAMERAMAN OF 1967 Cameras and other prizes must be won—see inside

wildlife
and the countryside

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Pigeon-cotes and dove-houses

The pigeons that eat the tourists' corn in Trafalgar Square today are direct descendants of the birds which the Romans first kept to provide them with food in winter, writes **Rita Spurr.** *William the Conqueror brought his round dovecots from Normandy, and until root crops were available to feed farm animals in winter, the lord of the manor relied for fresh meat on pigeon nestlings or* squabs.

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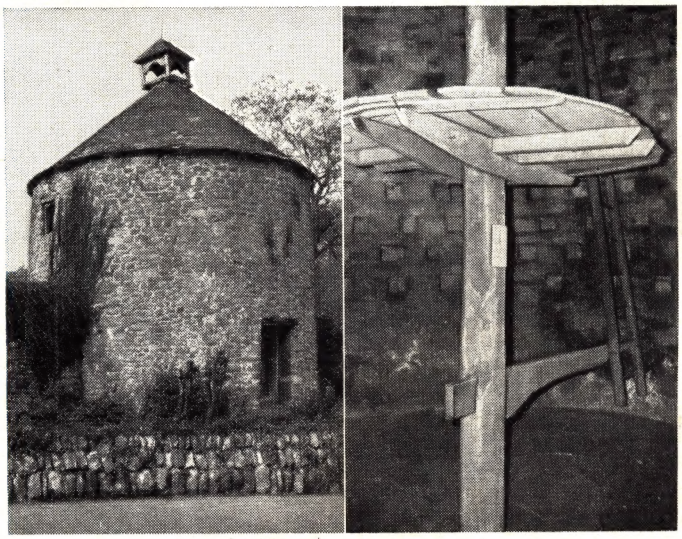

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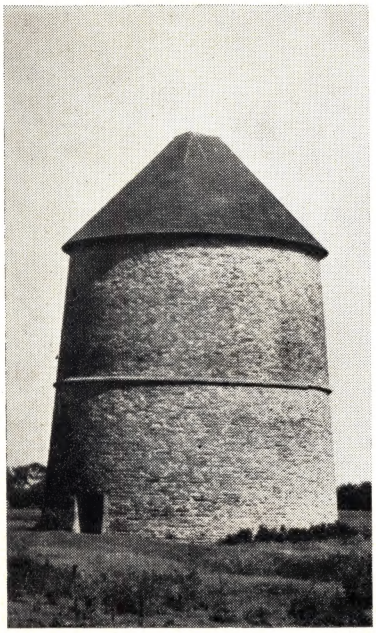

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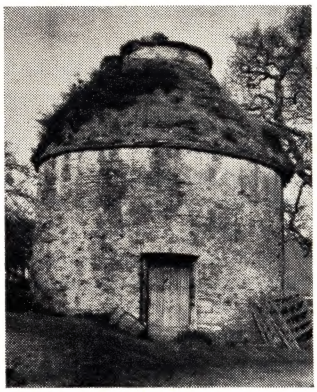
THE DOVE and the pigeon have had close and varied associations with man's existence from earliest recorded times. They appear in Biblical writings, in Greek mythology and in early Christian art. They had their niches in temple cornices, holes in walls and roof timbers.

All domestic breeds have evolved from the wild rock dove, *Columba livia*, which has now become rare in Britain. Normally 'pigeon' is used for the larger varieties, and 'dove' for the smaller ones, but the words are often used interchangeably. Dovehouses or *columbaria* were first introduced into Britain by the Romans, who gave pigeons individually-built homes round their villas and towns. But pigeon culture as a valuable source of food did not become established in Britain until the Norman military invaders reintroduced it nearly a thousand years later. During a siege, the pigeons housed on the military keep must have been almost as precious as the well which provided water.

The hordes of pigeons that infest town centres today are direct descendants of domestic doves and escaped racing pigeons. They are often as much a pest as the marauding wood pigeons *Columba palumbus* which flock in country fields, often alongside dovehouses that have been raised to the dignity of Ancient Monuments.

In mediaeval England, rabbits (or 'coneys' as they were then known) were snared and eaten as staple food by anyone who could get away with it. But pigeons were privileged birds. The peasant, on whose corn the pigeons grew plump, would snare the bird for his own pot at his peril. Penalties, if he was caught, were severe.

From Norman times onwards the keeping of pigeons for food purposes was the unquestioned privilege of the lord of the land. Only monasteries, abbeys and manorial estates were



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allowed to build and stock dovehouses and pigeon-cotes.

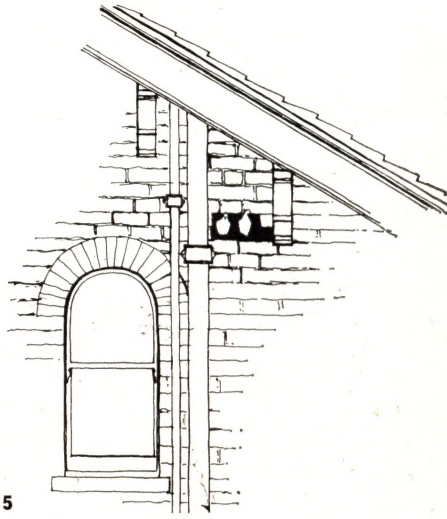
When some manor or abbey changed hands, the dovehouse might be mentioned as an asset in the inventory. As early as 1372 documents preserved in the safe custody of manorial, farm or monastic archives refer to dovehouses.

Until the practice of growing root-crops was adopted, in the mid-18th century, each autumn saw the slaughter of large numbers of cattle, for whom no feeding stuffs were available in winter. The meat was then salted. This incidentally, led to skin diseases being rife among the upper classes who owned and ate the cattle. The peasants were normally free from the disease in consequence of having no meat, but this was perhaps small consolation if the alternative was starvation!

In addition to its food value, the pigeon has, over the years, also provided a source of considerable chemical, economic and even medical value in its dung. In Persia, old pigeon-towers indicate the fertilising value of the nesting birds' dung, on which the Shahs grew their best melons.

The prolific breeding habits of the pigeon, which lays eggs on average eight times a year, made it well worth while to build houses with the maximum capacity for nests. Great care was given to choice of location and interior fittings, so as to provide sunlight and ventilation. Entrances were small, in order to exclude unwelcome intruders, particularly rats and owls. The L-shaped nesting holes had a small, dark chamber at the back, at right angles to the bird's

The Norman dovecot in the Vale of Porlock (4: *photo by J. D. U. Ward*) *was probably built by Hugh, Earl of Chester, nephew of William I. It has 302 nesting holes, and an entrance at the top. A later, 14th century dovecot at Sibthorpe, Notts* (3: *photo by Arthur Gaunt*) *is of similar design, but has more than 1,200 holes. The late mediaeval dovecot at Dunster in Somerset, in use until 1870,* (2: *photo by Conrad Lewis*) *still has a working* potence *inside. The square dovecot at Eardisland, Herefordshire* (1: *photo Rita Spurr*) *is probably of the same period. A typical modern nest-site for the descendants of dovecot pigeons is behind a missing ventilator grille, as on the Hampstead house below* (*drawing: Tessa Theobold*). *Photos* 2, 3 & 4 *courtesy of* The Countryman. *Some people, of course, keep pigeons today for racing. What sort of dovecots do these birds live in?*



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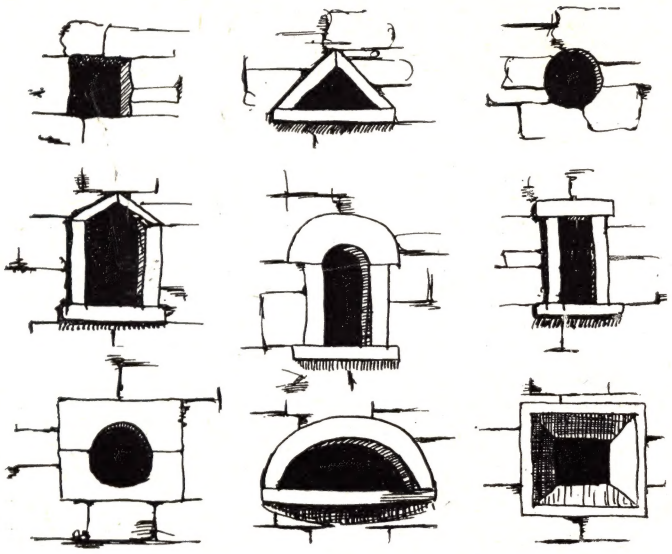

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entrance hole. This was for laying the eggs and for protecting the young from marauders.

Strict rules were laid down for the servants whose task it was to do the pigeons' household chores. For example they were forbidden to enter a dovehouse after noon, for pigeons had early-to-bed habits. They nested quietly in the dark, before rising at 3 or 4 o'clock in the morning.

Great cleanliness in the nesting-boxes was essential. Between seed-time and harvest, the birds had to be fed with supplementary supplies of corn—which again only the big manorial and monastic estates could afford to store.

The earlier shapes of dovehouses were round, made of stone or brick and rubble. The birds entered through an open *louvre* in the roof. A ladder known as a *potence* was fixed to a revolving frame and had extending arms. These enabled the nests to be reached for cleaning and for obtaining the young *squabs* or nestlings; adults were rarely eaten.

In later years, octagonal and square buildings became common, some half-timbered with gables, or with one or two storeys. For these shapes the potence would not be practicable. A well preserved example of one of the older forms is at Holbrook House, Somerset, and was probably built in the early 17th century. It contains 365 nesting-holes, leading one to believe that the owners ate well every day of the year! But this was small compared with the great 15th-century dovecot at Grantchester, which provided the Fellows of King's College, Cambridge, with two or three thousand doves a year for food and sale.

The famous dovehouse at Penmon Priory in Anglesey has an unusual feature. Built, it is thought, around 1600, it contains a thick, stone interior pillar, 12 foot high, serving as a potence in the centre of the building, with stone steps for mounting a ladder for access to the surrounding nests. There are said to be 999 nests, reaching up to the massive, domed roof and open cupola.

Herefordshire, a centre of rich agriculture, possesses numerous small and large dovehouse buildings. The best known is the pride of the picturesque village of Eardisland, situated by a mill stream among the busy farm activities of a small, restored manor house.

5

A few pigeons still 'home' voluntarily in a well-preserved round stone dovehouse at Great Milton, Oxfordshire. It adjoins an Elizabethan manor house, once probably a monastery, which enjoys another customary mediaeval

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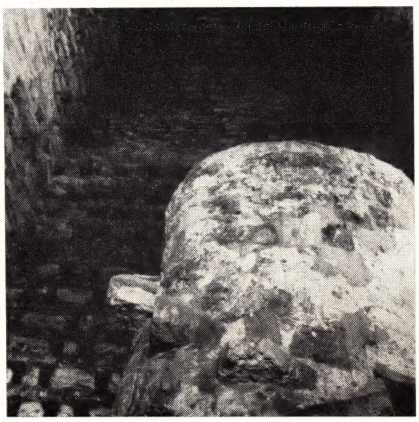

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The potence *inside the dovehouse at Penmon, Anglesey, is a huge stone pillar, with steps on which a ladder was rested* (3 & 4). (2) *is a ruined dovecot at Oxwich Castle, Gower. A typical Elizabethan dovehouse* (5) *was square rather than round, and the huge dovecot at Plas Bodewryd was probably built later still* (7). *Today, many buildings still contain pigeon lofts, with entrances in gable ends, though few have as many as the Post Office at Mansel Lacy, Herefordshire* (6). *Look for the entrance holes of disused pigeon lofts in town buildings, especially in old mews and stables.*
These far larger owl holes (6) *were sketched in and around Wharfedale, where farmers like owls in their barns to keep down mice.*

source of food from the carp inhabiting a sheltered pond in the same grounds.

With the changing pattern of farming and the relaxation of the necessary cleaning and feeding system for pigeon culture, the birds have largely deserted their one-time luxury homes. But at least a few hundred are being nationally preserved as worthy monuments, of which almost every county of England, Wales and Scotland has a number. Similar landmarks of social habits are found right across Europe.

Even in town areas, dovehouse structures may be found in the grounds of old country houses, as at Hayes Court and Swakeleys in Middlesex, at Hurley in Berkshire and at Patcham near Brighton. Former farm or stable buildings (now maybe converted into mews flats) may preserve tiers of pigeon holes under their gables.

The descendants of pigeons which are part of our domestic history now breed in vast numbers in towns and cities, reinforced by escaped racing pigeons. They roost and rest in the semi-dark crevices, under bridges, or on the high ledges of town buildings.

Who is to say that from a pigeon's-eye view, even our modern architecture does not remind them of their rocky, coastal haunts of long ago? Neglected as a luxury food, hunted as a pest, the pigeon still has many memorials to its history.

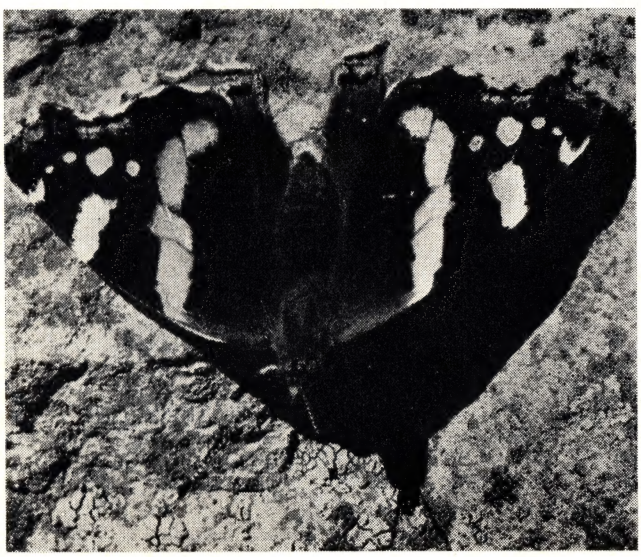
7

Drawing by Ursula W. Brighouse and photos by Eric G. Meadows (6) and Leonard and Marjorie Gayton (7): courtesy of The Countryman. *Photos 2, 3, 4 & 5 by Rita Spurr.*

John Burton, who last October wrote for us about his experiments with migrating monarchs, describes those butterflies which are on the wing in the spring and early summer.

Photos by L. Hugh Newman (monarch) and Jane Burton

Butterflies in the spring



TWO WINTERS AGO a small tortoiseshell butterfly chose to hibernate in my study. Most of the time it clung motionless to the wall in a dark corner just below the ceiling, its antennae withdrawn from view between its wings. In this resting position the dark underwings hid the bright colours of its upperwings and rendered it inconspicuous among the dark shadows.

In mild spells in February and March it stirred, opened and shut its wings rhythmically and, when the sunshine streamed in, even fluttered against the window. But when the weather became cold again it returned to its dark corner and remained as motionless as before. Then one warm, sunny spring-like day in mid-March it flew strongly against the window. I let it out, and it flew away to join the other small tortoiseshells that had ventured forth to sip the revitalising nectar of the lesser celandine and other spring flowers.

The small tortoiseshell is one of the first of our butterflies to appear in spring, sometimes being seen as early as February, but most usually in late March or early April. Another species which appears on the wing at about the same time is the brimstone. To see one of the lovely sulphur-yellow males careering along a country lane or hedgerow in early spring is an uplifting experience after the long, drab days of winter. The gaudy-eyed peacock and the jagged-winged comma butterflies may also be seen as early as March, spreading their wings in the fitful sunshine, but April and May are the best spring months to look for them.

All the butterflies mentioned so far have hibernated in the adult (butterfly) stage. Most British species pass the winter either as a larva (caterpillar) or pupa (chrysalis). The familiar cabbage whites over-winter as pupae attached by a silken girdle to walls, fences or tree-trunks and emerge during April; the small white is generally the first to do so, but is soon followed by the large white. In late spring their numbers are reinforced by the arrival of immigrants from the Continent, to the fury of the cultivator of cabbages and allied crops.

holly blues and grizzled skippers

ABOUT mid-April the green-veined white and the holly blue also creep out of the pupae in which they have spent the winter, and are often seen in gardens. The first brood of the holly blue is on the wing until early June and is also seen in and about woods, where the females seek out the holly

flower buds on which to lay their blue-green eggs. This species fluctuates greatly in numbers from year to year and has been generally scarce for several years now. Maybe 1967 will prove to be a happier one for it.

The diminutive grizzled skipper and the graceful orange-tip are two more butterflies which leave their pupae towards the end of April, although May and June are the best months to see them. Rough open grassy places and wood clearings are the favoured haunts of the grizzled skipper. The orange-tip may be seen here too, although it is probably most associated in the naturalist's mind with country lanes bordered with a glorious mixture of white-flowered cow parsley, jack-by-the-hedge and lady's smock. Of all butterflies this pretty insect is, for me, the most evocative of spring.

fritillaries among the primroses

ANOTHER characteristic butterfly harbinger of spring (although it may be found throughout the summer) is the speckled wood. Over-wintering in this species occurs either in the larval or in the pupal stages: those butterflies which wintered as pupae appear during April and early May; those which did so as larvae in late May and June. The pale yellowish blotches on their sooty-brown wings make them inconspicuous amongst the dappled sunlight of their shady, woodland haunts.

In grassy places at the end of April and from May onwards through the summer the common blue may be found flying swiftly among the wild flowers. On chalk and limestone hills of the southern counties it may be joined in May and June by the rarer and jewel-like adonis blue. Both these butterflies have passed the winter as larvae, and during May several other common species which have done likewise generally make their first appearance: pearl-bordered and marsh fritillaries, wall browns, small heaths, small coppers and dingy skippers. In open, bushy places all over the British Isles the green hairstreak comes forth in May, while at the same time in sunny clearings in some southern woods Duke of Burgundy fritillaries flit among the primroses. More locally still in shady woods of Ireland and southern England the lucky observer may chance upon the dainty, fragile wood white flying weakly in the shady rides and glades.

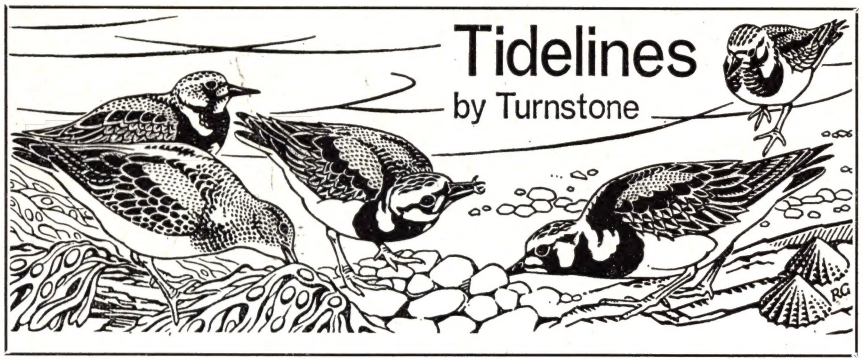
why are they rarer?

MAY and June are the months when some of our migrant butterflies reach our shores. I have already mentioned the large and small whites. With them arrive variable numbers of painted ladies, red admirals, clouded yellows and, more rarely, pale clouded yellows. Red admirals not infrequently reach us as early as April, and painted ladies even as early as March. With their arrival, and with the appearance of half-a-dozen more species in June (including the meadow brown—perhaps, the commonest of them all) our islands, at least in the south, should be swarming with butterflies in a favourable year. It is an unfortunate fact, however, that good years for butterflies seem to have become a rare event these days. The reasons for this situation are far from clear. Maybe it is due to toxic chemicals or climatic changes or the destruction of habitats; perhaps, it is combination of all three factors. We still need to find out.

Butterflies are usually seen either feeding or laying eggs. A spray of plant with eggs on it can be wrapped round in a bag of butter muslin tied with string, and left where it is growing. After the eggs are hatched, the caterpillars can be fetched indoors, on sprigs of the same plant, and kept until they pupate into a chrysalis and finally emerge as small butterflies.

Photo opposite: Tortoiseshell (top), Monarch (middle) and Red Admiral (bottom). Above: Peacock, right: Comma and below Chalkhill Blue.

Photos by George Hyde (comma) and Jane Burton.



cameras and cameras

WHEN I TALKED recently to Jim Stuttard, general secretary of the Council for Nature, about the prizes in our photographic competition, he told me that he hoped readers would not get the impression that cameras as expensive as the Asahi Pentax are essential for photographing wildlife. The Pentax is probably one of the best cameras available today for wildlife work, but excellent work can still be achieved with cheaper equipment.

Jim Stuttard uses, as his sole camera. a 35 mm. Kodak *Retina* which he bought second-hand thirty years ago. He has taken many thousands of pictures with it—human, scenic and natural history—from sea level to 20,000 ft. altitude and in all climates except polar. He paid eight pounds ten for the camera, and "it struck me as expensive at the time", he told me.

footways for Scotland

A GLEAM in the eye of ramblers is how *The Guardian* recently described the idea of some long-distance footpaths for Scotland, which would link up with the Pennine Way at Kirk Yetholm in the Cheviots and perhaps lead through to the Highlands and the Western Isles. From Cheviot to Edinburgh the walk would follow the Roman Dere Street, and by using the Old Forth and Clyde and Union canals, as well as some abandoned railway lines, it could be extended to the Highlands. These ideas are not just Mancunian dreams: the National Trust for Scotland is surveying a route this summer for two fifteen mile sections near the Border.

Better still, the Highland Development Corporation is discussing with the Inverness County Council a plan for *Wade's Way*, to follow the old military road built by General Wade to subdue the Jacobite Highlanders in the eighteenth century. It is hoped that the restoration of the road would be carried out by young Scottish volunteers, with the Highland Board providing the funds.

transcontinental walkers

IT WOULD be an inspiring achievement if one network of paths could link the Peak District with the Skye Ferry. In case the very idea seems too grandiose to the powers-that-be, let me remind them of the long-distance footpaths in America, where the Appalachian Trail sweeps down the eastern seaboard from Mount Katahdin in Maine to Springer Mountain in Georgia, two thousand miles and more to the south.

What is more, there are moves afoot to get US Government support for a 20,000 mile nation wide system of scenic trails, a scheme that already has the approval of the President. Nine trails beside the Appalachian are envisaged; many of them already exist. The Pacific Crest Trail would march from Canada down the Rockies to Mexico. The hiker with a year or two to spare would be able to walk from Maine to the Pacific along the North Country Trail and the Lewis and Clark Trail, or from Texas to Fort Vancouver via the Santa Fe and the Oregon Trails.

Alongside these distances, the Scottish plans may seem small beer. Yet to be able to follow Agricola's legions from the Wall to the Forth, and the Hanoverian redcoats away west to the Isles, hardly touching tarmac all the way, through some of Britain's most magnificent scenery, is a dream which we must not let the authorities forget.

impassable paths

BUT WHAT about the Pennine Way itself? The National Parks Commission claims that many people walk the whole 250-mile route. Yet one experienced walker told me recently that in many places the Pennine Way was impassable last year, blocked by fences and other barriers. It was on occasions completely unmarked (although in some stretches the opposite is true: it is well signposted near Holme Moss in Cheshire, for example). In other spots the Way didn't exist at all, he says, since there was no path of any description in sight. I wonder how long it is since any officials of the National Parks Commission, who are responsible for the Pennine Way, walked along these stretches?

how many millions?

I HAVE just heard from the National Audubon Society that the United States Census Bureau has discovered over eleven million birdwatchers in the United States, of which three million are wildlife photographers. If my arithmetic is correct, this means that there ought to be nearly two million birdwatchers and about 500,000 photographers in Britain, and if there are not already this number, I suspect there very soon will be.

fleeing from moles

BRUCE CAMPBELL was asked at a natural history society meeting in Oxford recently how he would advise the Botanic Garden to deal with moles which persisted in burrowing under its plants. He said that there was no satisfactory method of keeping moles out, but had some very simple advice to anyone who was seriously bothered by these animals: "Emigrate to Ireland, where there aren't any."

beechingways

AFTER my comments in February about the urgent need to turn some disused railway lines into walkways through the countryside, I was delighted

to learn the other day that the Lancashire County Council is doing just this alongside the Lune Estuary. The Council is planning to buy three miles of the railway between Glasson Dock and Lancaster, and to turn it into a "green way" for walking and horse riding. The Council hopes to acquire a number of different lines throughout the county.

film show

AT THE Royal Festival Hall, South Bank, London SE1 at 8 p.m. on Friday April 28 the Council for Nature is showing three award-winning films that should be well worth seeing. David Attenborough will introduce the colour premiere of *The Private Life of the Kingfisher*, which has twice been seen recently in black-and-white on BBC TV. It was filmed by Ronald and Rosemary Eastman, and is introduced by Peter Scott.

The supporting programme includes *Sea Sanctuary* (about the seals and seabirds of the Farne Islands) and *The Great Adventure* (about wildlife in northern Sweden). Seats are available from the Festival Hall box office from 28 March at prices from 5/- to 15/-; there are reduced rates for parties of twenty or more.

who—us?

IT LOOKS as if, when all the facts are known, that pesticides may turn out not to have been responsible for such enormous damage to our bird life as was feared a few years ago. I was recently invited by Shell to look round their agricultural research centre at Sittingbourne and found some of the scientists there very critical of the agitation against pesticides which followed Rachel Carson's book *Silent Spring*.

Certainly many early fears have proved unfounded. But what is the alternative to sounding the alarm before we are absolutely certain? Should we wait until there is positive proof that a particular chemical is dangerous to wildlife? If we had done this over the really deadly insecticides, by now the kestrel, sparrowhawk and peregrine might be virtually extinct in Britain. It was only the early and perhaps exaggerated campaign of naturalists which led to very rigorous restrictions on certain chemicals. Now, of course, the chemical manufacturers would rather like to forget the fact that they hotly opposed these restrictions when they were first suggested!

canal reserves

I WAS talking recently to Ted Smith, of the County Naturalists' Trusts' Committee about our article on canals, and was surprised to learn how many trusts already have canalside reserves. For example, the Monmouthshire Trust has a reserve on half a mile of the Brecon-Monmouth Canal at Cwmbran. The Leicestershire Trust has produced a guide to two stretches of the Grand Union Canal which it adminsters. Wiltshire has an agreement to look after a mile of the Kennet & Avon Canal, and runs a nature trail on it. The Northamptonshire Trust actually owns three miles of the Buckingham arm of the Grand Union Canal. All these reserves are used by local schools or universities.

flood of reservoirs

THE decision of the House of Lords to allow the reservoir at Cow Green in Upper Teesdale was a tremendous setback to the conservation movement. But at least the two-year controversy has made vast numbers of people aware of the dangers of drowning one upland dale after another. The latest battle is in the Upper Towy Valley, where a singularly beautiful area of woodland, with many unusual plants and birds in it, is wanted by Swansea for a reservoir.

questionnaires

THOUSANDS of last month's questionnaires have been flooding into our offices. The Editor wishes to thank readers for their wonderful response. Some suggestions will be used at once. More details next month.

If you are interested in animal life generally, join the **National Zoological Society**, S.A.E. for details to the Secretary, National Zoological Society, c/o Zoological Gardens, Ashover, Chesterfield, Derbyshire. —Advt

"It's not oil. They've been gassed."

Cartoon © Punch

Above: honey buzzard chicks by Gerhard Geiss. Opposite: kestrel by Neave Parker.

RAPTORS in retreat

Derek Ratcliffe, of the Nature Conservancy's Monks Wood research station, considers why our birds of prey have declined and what are their hopes in the future.

THE HISTORY of birds of prey in the British Isles is not a happy one. Their fall from grace, after the mediaeval heyday of falconry, accelerated rapidly during the Victorian era of intensive game preserving, when all raptors became regarded as competitors with Man. With the growth of sheep rearing, the larger species also fell under suspicion of lamb killing. Yet as little as two centuries ago, the British Isles boasted the respectable total of fifteen breeding species of birds of prey.

fringe species

THEY all probably had substantial populations, though some were naturally always more sparsely distributed than others. Most species were restricted in some degree by a limited choice of habitat: for example, the peregrine in Britain seldom nests anywhere but on cliffs. Others, such as the hobby, goshawk and honey buzzard are perhaps only "fringe" continental species with us, while the merlin, golden eagle, white-tailed eagle, and osprey seem always to have had a northern bias in distribution during historic times. The territorial requirements of raptors also impose fairly strict limits on breeding density and so limit the total population size. Those species needing a large territory, such as the eagles, are thus unlikely ever to have been really common in the past.

By 1900, the goshawk was virtually extinct in Britain, and the red kite, marsh harrier, honey buzzard, osprey and white-tailed eagle were reduced to miserable remnants hanging on in a few remote or specially protected areas. The last two faded out altogether within the next two decades, and the honey buzzard became only a sporadic breeder. But under rigorous protection the kite hung on in the wooded valleys of south-central Wales and the marsh harrier in the marshes of East Anglia. All three harriers were once fairly widespread and bred together, for instance, on the wild Cheviot moorlands. But the hen harrier was banished to the far north of Scotland (mainly Orkney), while Montagu's harrier became restricted to a few areas of southern and eastern England.

Between the two wars, the remaining birds of prey held their own fairly well. The common buzzard, though eradicated from most of eastern and lowland Britain, flourished in much of the hill country and on the rocky coasts of the west. About 1,000 pairs of peregrines still attempted to breed annually in the British Isles, despite a long-term decline in the western Highlands, caused apparently by dwindling food supply. The golden eagle was lost to Wales and northern England, but held its numbers in the Scottish Highlands, especially in remote deer-forest country, where it was tolerated rather than preserved. The merlin was found in nearly all moorland areas, and the hobby still bred in reasonable strength in southern England, while the sparrowhawk remained everywhere plentiful in the woods and the kestrel was common over a much wider range of habitat.

During the Second War, an Air Ministry "control" campaign (to safeguard carrier pigeons) almost exterminated the peregrine in southern England, and reduced its numbers elsewhere. However, many Scottish peregrines were freed from keeper persecution during this period, and the Irish population was largely unaffected. After 1945, when "control" ceased, deserted haunts were re-occupied rapidly, and in a few years, the peregrine seemed well set to recover its pre-war level of population.

Other trends, perhaps initiated during the war, became apparent at the same time. The hen harrier staged a remarkable recovery, re-occupying many of the Scottish moorlands, and it is now breeding in the Cheviots, Wales, and various parts of Ireland. Montagu's harrier spread out widely to the north and west, to overlap its relative in breeding distribution again, and more nesting places of the marsh harrier became known. The golden eagle became firmly re-established in Galloway, and this species was seen increasingly in northern England, where at least two nests have been built, though apparently by unmated birds. Common buzzards also appeared to recover ground in an easterly direction in lowland woods.

ospreys come back

SPORADIC nestings of goshawk were reported and the honey buzzard returned to nest regularly in southern England. Then, in the mid-1950's, ospreys returned to their original haunts in the pine forests of the Cairngorms and, under stringent protection, have kept a steady foothold. These ospreys are obviously an overflow from the expanding Scandinavian population, and there is hope that they will eventually return to the long deserted haunts on wild moorland lochs of north-west Scotland.

The sparrowhawk and kestrel showed no noticeable post-1945 change. Both were probably at about saturation level, though the kestrel is normally prone to periodic fluctuation in areas where its favourite prey, the short-tailed field vole, has cycles of abundance. The hobby was no more numerous than before 1939, while the kite, despite all conservation effort, had not improved its position significantly. Moreover, the merlin showed signs of local decline, especially in certain once favoured Pennine areas.

On balance, therefore, the post-war status of British raptors at first suggested overall improvement. The first set-back was in 1954-55, when the myxomatosis epidemic caused a sharp decline in common buzzard populations in areas where the rabbit had been favourite prey. But, by adapting to a more varied diet, the bird later recovered in many places.

crash!

THEN, during the period 1958-62, the peregrine and sparrowhawk suffered an unprecedented "crash" in numbers, though the severity of decline decreased with distance north, up to the Highlands. By 1962 the peregrine was reduced in the United Kingdom to about half its pre-war breeding population. In many districts this decline was preceded or accompanied by frequent egg-breakage or failure to lay, so that breeding success of remaining adults was low. The "crash" seems, however, to have resulted from widespread death of adults. The kestrel was also affected, but less severely, and mainly in southern and eastern England.

The decline of these three species has been attributed to the toxic effects of persistent pesticide residues (notably of aldrin, dieldrin and heptachlor) which came into wide agricultural use at this time and contaminated the prey on which these raptors fed. The severity of decline also coincided geographically with scale of pesticide use. From the amounts of these residues detected in the tissues of peregrines, sparrowhawks and kestrels found dead, it is a reasonable conclusion that many individuals accumulated a lethal dose, and analysis of eggs has shown that probably the whole populations of these birds are contaminated in some degree. This case against pesticides has been challenged, especially by those with a vested interest, but no one has provided a feasible alternative explanation for this raptor decline.

Notwithstanding myxomatosis, buzzards were still increasing locally up to 1960, but then the trend seemed to be reversed and breeding success fell, as in Lakeland. From this date, golden eagles over much of western Scotland also showed substantial reduction in output of young (though not in adult population). There were fears, still not allayed, that dieldrin sheep dips were affecting both species through their fondness for carrion mutton. Similar anxiety over poor breeding success in the Welsh kite has since been relieved by two unusually good breeding seasons. Both Montagu's and marsh harriers

have declined again in recent years, but the causes are still obscure. And, though they are certainly contaminated, there is no evidence that the merlin, hobby, hen harrier and osprey have been adversely affected by pesticides.

Measures to reduce environmental contamination by the most toxic pesticides may well be taking effect, for the decline of the peregrine, sparrowhawk and kestrel has halted, and in 1966 there were even signs of local recovery. The peregrine still remained scarce in England and Wales, though, and the golden eagle again had a poor breeding season in the west Highlands.

However, even if the pesticide situation improves radically, our birds of prey will still face much adversity. Gamekeepers are continuously distributed over much of our land surface. There is little doubt that they mop up most of the annual surplus of raptors, especially of common buzzard and of the harriers, which would otherwise recolonise long-lost haunts away from their strongholds.

worse in Europe

TOLERANCE and enlightenment spread slowly in this profession (though there are notable exceptions) and while some landowners and tenants set a fine example in conservation, others are incredibly reactionary in their attitude to "vermin". The finding, a few weeks ago, of a snowy owl dead in a pole-trap on a Scottish estate shows that we have still a long way to go in this respect.

Pressure for full economic exploitation of land will continue to increase and wildlife in general will suffer loss of ground in proportion. Despite the growing interest in birds, there is bound to be clash of incompatible interests. Complete recovery of the peregrine, for instance, would give no joy to pigeon-racing enthusiasts. Provided strict protection of certain rarities is ensured, egg collecting and illegal taking of young for falconry on the present scale are unlikely to damage our raptor populations significantly, and it is the advancing tide of "progress" which is most to be feared.

We may take heart that the situation here is better than in some European countries. There, despite the larger number of species, many birds of prey seem to be taking a still bigger hammering than in Britain, whether from pesticides or shooters, or both. Along with Spain, our islands are now the European headquarters of the peregrine and golden eagle. Wildlife conservation will prosper in proportion to the support it receives from the public. The raptors would perhaps benefit more than most birds from an educational advance in this field. Ornithologists who wish to continue to enjoy seeing and studying these fine creatures in their native haunts, and falconers who relish the thrill of flying them, will therefore have to contribute to their cause in as positive a way as they can.

REPTILES and AMPHIBIANS

Britain does not have many of these animals: Ireland has only four. They are all, except perhaps the snakes, becoming rarer. Partly this is due to destruction of ponds and other habitats; partly it is due to collecting. Look for them quietly in likely spots—see details on right. For snakes and lizards, choose warm, sunny days. Collect a small amount of the spawn of frogs, toads and newts, and hatch it out. If you capture an animal to look at it, release it as soon as possible. Don't grab at lizards' tails: they will break off. And don't touch snakes until you are sure they are not adders. These animals are very variable in colouring: if in doubt consult books (eg *Young Specialist Looks at Reptiles and Amphibians:* edited by Alfred Leutscher, Burke, 8s 6d). Above is the head of a sand lizard. Below are a female common lizard (top left), female sand lizard (bottom left), male sand lizard (top right) and male common lizard (bottom right). Above centre are two male adders fighting in the spring, and above right a female adder with her young. More illustrations on front and back covers.

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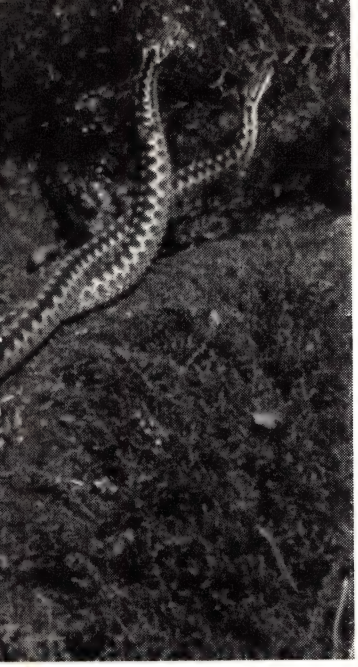

Photos by Geoffrey Kinns (lizards), Karl Stülcken (centre) and Jane Burton (right).

MPHIBIANS gs and Toads	**Common Frog**	Damp places: needs open water only for breeding.	Up to 4″ long. Brownish colour, usually with spotted belly.
	Marsh Frog	Ditches and canals around Romney Marsh, Kent.	Up to 6″ long—very large. Olive green, with grey thighs. Basks in sun.
	Edible Frog	A few marshes around London, and possibly also E. Anglia. Rare.	Up to 3½″ long. Green back, often with yellow stripe down centre.
	Common Toad	Woods, gardens, fields, even cellars. Not Ireland.	Up to 5″. Warty back, plump body. Toads have shorter hind legs than frogs: they cannot leap.
	Natterjack Toad	Sandy heaths and dunes in S, SW & NW England and SW Ireland. Rare.	Up to 3½″ long. Yellow stripe down middle of back. Very short hind legs—can *run*.
MPHIBIANS wts	**Palmate Newt** *Triturus helveticus*	Slow streams, ditches, pools. Not in low areas like East Anglia, nor in Ireland.	Up to 3½″. Olive above; centre of belly yellow, bordered white; throat usually unspotted. Black toe webs on male hind feet in spring.
	Smooth newt *Triturus vulgaris*	Common in shallow, still water.	Up to 4½″. Brown above. Pale yellow belly with white border; belly has large dark spots in male, tiny dots in female. Crest in spring males.
	Crested newt *Triturus cristatus*	Ditches, ponds, canals, marshes. Not Ireland.	Up to 6″. Warty skin. Dark above, with yellow belly thickly mottled in black. Crest in spring males.
PTILES ards	**Common Lizard**	Woodland, heaths, moors, dunes.	Up to 7″. Slender body, brown above. Good swimmer.
	Sand Lizard	Restricted to sandy heaths and dunes in parts of S & NW England. Rare.	Up to 8″. Heavier build, short legs. Back has dark spots with white centres. Summer male bright green flanks.
	Slow Worm	Open woods, commons, heaths, gardens. Not Ireland.	Up to 20″. Legless, snake-like. Very smooth; silvery grey or brown above, usually with dark line down the back.
PTILES akes	**Grass Snake**	Woodland, hedgerows and marshes, usually near water; common. Not Ireland.	Up to 3′ 6″. Olive green, with white or yellow patches behind head. Sides of body barred with black.
	Smooth Snake	Dry, stony places in sandy woods and heaths, usually near water. SE England: rare.	Up to 2′ 6″. Brown or grey, with stripe through eye.
	Adder or Viper	Commonest snake, found in quiet, dry and sunny spots, especially on moorlands and heaths. Not Ireland.	Up to 2′ 6″. Very variable in colour, but almost always has strong black zig-zag pattern on back.

The Wildlife Youth Service

OF THE WORLD WILDLIFE FUND

WILDLIFE RANGER

PANDA CLUB

President: Peter Scott *Director*: Cyril Littlewood

Headquarters: 120a London Road, Morden, Surrey. *Telephone:* MITcham 0419

Wildlife at Olympia

THE Wildlife Youth Service exhibit attracted considerable comment and attention at the Schoolboys' and Schoolgirls' Exhibition at Olympia this year. Hundreds of young people entered the special *Spot the African Wildlife* competition featured on the stand. The WYS mounted a striking display of scraperboard wildlife studies by artist John Thomas. The black-and-white drawings were displayed against the orange and blue walls of the stand with remarkable effect. Supporting this display was a panel provided by *Wildlife and the Countryside* which advertised both the magazine and the WYS Full Membership Scheme. The exhibit proved so successful that it was repeated at exhibitions in Cardiff and Birmingham.

The Butterfly Bush

COMING up in the magazine in June is the latest WYS Project—a study of *Buddleia*, the shrub that butterflies love. Where does it grow? How fast is it spreading in the wild? What butterflies feed on it? We are going to ask you to tell us this summer.

Competition Winners

THE competition involved the identification of 43 species of African animals, illustrated on a map. We thought that you might like to try *your* skill at this identification game, and so we have printed the map on the opposite page for your amusement and interest. The answers will appear in the next issue of *Wildlife and the Countryside*—so don't lose *this* copy if you complete the list. No 1 on the map is a Barbary Ape, so having got you safely started we will leave the remaining 42 animals for you to identify!

At Olympia there were prizes for the competitors who gained the highest score. The winner of the First Prize (with 39 correct identifications—can *you* beat this?) was 11-year-old Anthony Meier of Catford, London. He won two free places at one of the WYS Adventure Camp Holidays in Snowdonia, and has invited his younger sister to be his guest. The second prize was awarded to 12½-year-old Redhill schoolgirl Diana Liverman, with a score of just one less than Anthony's: 38.

Diana received replicas of the famous Peking Panda *Li-Li* and her baby together with a copy of *Britain's Wildlife* autographed by Peter Scott, Harry Secombe, Rolf Harris, Johnny Morris and Cyril Littlewood. The runners up also received prizes of wildlife books, the well known *Wildlife Game* or Full Membership gift tokens for the Panda Club or Wildlife Rangers. These prize-winners were: R. Beadsmoore (15) of Derby and J. R. Thomlinson (12¾) of Kent, who both scored 37; and P. J. Burgess (13) of East Yorkshire, Ann Bickford (13) of Surrey, Graeme Bowles (11) of Oxfordshire, J. Woodruff (12¾) of London and William Kesson (12) of Benfleet, who all scored 36.

Membership Card and Badge Designs

FOR some time now we have been doing our best to complete the selection and final judging of the WYS membership card project and the windcheater badge design competition. The prize-winning entries will be announced in the next issue of *Wildlife and the Countryside*, and winners will be notified by letter in advance.

Map by Thomas

Spot the African wildlife

1 *Barbary ape*
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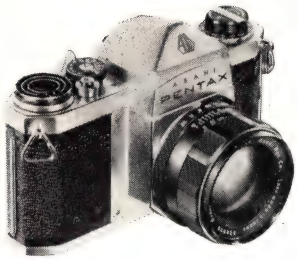
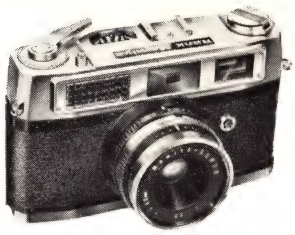
A BOOK PRIZE for the first correct entry to reach Cyril Littlewood. We regret that other entries cannot be acknowledged.

THE COUNCIL FOR NATURE



Wildlife Cameraman of 1967



Two superb cameras to be won — Twenty close-up lenses — Special prizes for winners aged under sixteen — Enter as many photos as you wish

First prize in the Council for Nature's *Wildlife Cameraman of 1967* amateur photographic competition is an £80 *Asahi Pentax* S1a 35mm camera (left). One of the finest cameras available today for wildlife photography, it has a 55mm *f*/2 lens focussing as close as 18 in, with shutter speeds from 1 to 1/500 seconds. There are also consolation prizes—three subscriptions to *Photography* magazine and ten prizes of a close-up lens specially made to fit *your* camera.

Under Sixteens: Some prizes are reserved for winners who are aged 15 and under on 1 June 1967. First under-16's prize is a £30 *Mamiya Ranger* 35mm camera (right), with a 40mm *f*/2·8 lens with speeds up to 1/250 seconds. And there are ten more close-up lenses to be won. Of course, under 16's are still eligible to win the Asahi Pentax.

Judges: Dr Bruce Campbell, the famous ornithologist who is a member of our editorial board; Stanley Jeeves, one of Britain's leading wildlife photographers; and Jon Tinker, the Editor.

How to enter: You can enter as many photographs as you wish, but each entry must have the official entry form pasted on the back. This form will be reprinted in the next four issues of the magazine. Closing date is 6 October 1967. Send your entry in early—the best entries we receive will be published in the magazine over the next few months. Winning entries will be published in the November 1967 issue of *Wildlife and the Countryside*. You may enter any black-and-white photograph of a wild plant or animal; this includes birds, insects or any other form of animal life.

How to win: The judges are not looking just for a technically superb photograph. A photograph must be of wildlife interest. A shot of a pair of fox cubs playing with a twig would be more likely to win than an equally good photo of a fox doing nothing in particular. Again, the judges will consider how difficult the entrant's photograph was to take. For example, a heron feeding alongside a river is much harder to photograph than a blackbird on a bird-table; but a heron in a pool at the zoo is easier still. You are asked to state whether the subject of your photo was in its natural surroundings in the wild. This does not mean that a blackbird on a bird-table or a heron at a zoo *cannot* win a prize. It merely means that the judges will expect such a photograph to be of a higher standard than one taken under more difficult conditions.

Your camera does not have to be expensive to get good results. Many people take poor photos because they never trouble to master their elaborate equipment. Automatic cameras, for example, are often not very versatile. The important thing is to discover exactly what the capabilities of *your* camera are. But there is no doubt that a telephoto lens makes certain shots possible that are impossible without it. The judges will take this factor, and the make of your camera, into account. So, whatever your equipment, you can still win.

A warning: *The wildlife photographer must place the welfare of the animal or plant first.* Rare flowers must not be picked. Young mammals should not be handled, or their parents may abandon them. Extreme care must be taken with nesting birds. If you have to tie back foliage to get a shot of a nest, always replace it or you may expose the eggs to crows. Never keep birds away from their nests for long. With shy or rare birds, do not go near the nest at all, or you may cause desertion.

RULES

1. Entries must be photographs of a native or naturalised wild European plant or animal (animals include insects, birds, reptiles and other forms of animal life). If the subject was photographed in captivity or elsewhere than in its natural surroundings, this must be stated on the entry form.

2. Entries must have been taken in Europe after 1 January 1966, and must not have been published.

3. No one who has sold six or more photographs to publishers of newspapers, magazines, books, Christmas cards or calendars since 1 January 1964, and no member of the editorial staff of *Wildlife and the Countryside* or their relatives, may enter the competition.

4. The photograph must be a glossy or matt black-and-white unmounted print, at least 4 in. x 5 in. in size.

5. The entry form accompanying the photograph must include the name and address of the photographer; where and when the photograph was taken; the make and type of camera and whether or not a telephoto lens was used; and a brief caption of not more than twenty words describing the photograph. The entry form must be fastened with sticky tape or glued to the back of the photograph; paper clips must not be used.

6. Readers may enter as many photographs as they wish, but no more than one prize can be awarded to one person. Each photograph entered must be accompanied by a separate entry form, which may be taken from the April, the May, the June, the July/August, or the September/October, 1967 issue of *Wildlife and the Countryside.*

7. Entries must reach The Editor, *Wildlife and the Countryside,* 10 Bouverie Street, London EC4 not later than Friday, 6 October, 1967.

8. Entry of a photograph gives *Wildlife and the Countryside* the exclusive right to reproduce it in the magazine until 31 December, 1968. The copyright will remain the property of the entrant. Entries which win a prize may be published without payment, but any others published will be paid for at the usual rates.

9. The prizewinners will be selected by a panel of judges consisting

of Dr Bruce Campbell, Stanley Jeeves and the Editor. Their decision and interpretation of the rules will be final, and no correspondence will be entered into.

10. The results of the competition, and some or all of the winning entries, will be published in the December 1967 issue of *Wildlife and the Countryside*.

11. Prints, other than those retained for possible publication, will be returned to entrants if accompanied by a suitable stamped and self-addressed envelope. While all reasonable care will be taken, neither the judges nor *Wildlife and the Countryside* will be liable for loss of or damage to prints submitted.

12. Competitors must take great care to guard the welfare of the wild animals and plants they are photographing. The judges reserve the right to disqualify an entry if the entrant does not on enquiry satisfy them that this condition has been met.

cut out here

Wildlife and the Countryside and Council for Nature

Amateur photographic competition

ENTRY FORM

Name .....(capitals, please)

Address .....

.....

.....

This photograph was taken by me personally at.....

.....place

on.....(date)

using the following camera.....

The subject *was/was not* in captivity or elsewhere than in its natural surroundings.

I *did/did not* use a telephoto lens to take this photograph.
My caption is.....

.....

.....(maximum of 20 words)

My sixteenth birthday falls *before/on/after* 1 June 1967.
(If on or after 1 June 1967, a parent or guardian *must* countersign this form)

I declare that I have read rule 3, and the other rules of the competition, and that my entry is in accordance with these rules.

Signed .....

Signature of parent or guardian.....

J-P

Precision SUPER MOWERS

SUPER Mk. 5 POWER MOWER
in two sizes
17″
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POWERED BY A FOUR STROKE ENGINE, THIS POWER MOWER IS DESIGNED TO TAKE THE ROUGH WITH THE SMOOTH, AND HAS VARIABLE SPEED CONTROL WHILST IN OPERATION WITHOUT LOSS OF CUTTER SPEED.

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17″ & 20″	Power Mower	14″ & 16″	Power Mower	12″ & 14″	Hand Mower

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GROWING UP IN BRITAIN

Elspeth Huxley has been making a first-hand study of British children today. In eight articles* she provides a fresh picture of the problems that confront parents, teachers, doctors, welfare workers, etc. in their dealings with the young.

***Under these titles: Under Fives, Fun with Fractions, Revolution in the Primary School, Streaming and Creaming, Into Hospital, An Inspector Calls, In Care, Handicapped.**

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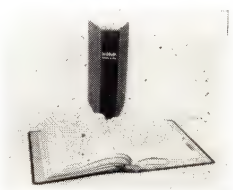
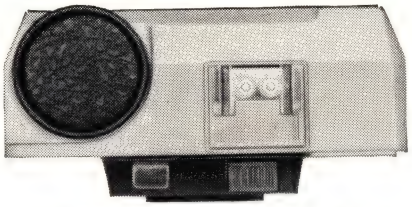


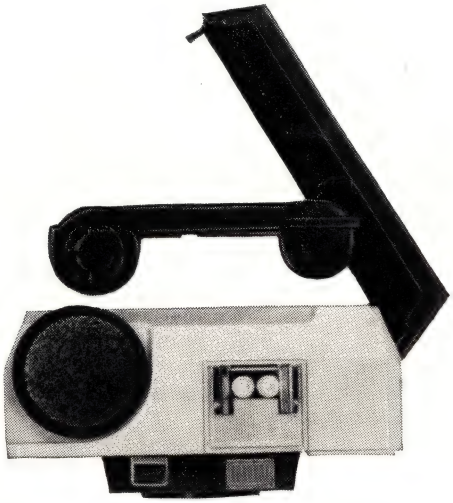
Do you collect wildlife?

Why not keep a complete collection of *Wildlife and the Countryside* from when it started in April 1966? Sets of six issues (April-November 1966): 7/6. Single back numbers: 1/9. And why not have a permanent binder, like the one shown above? It will take two years' copies, and is handsomely bound in red and black, with the title of the magazine in gold. It costs 15/-. Or you can get a cardboard wallet folder, specially made for us and taking two years' magazines for 2/-.

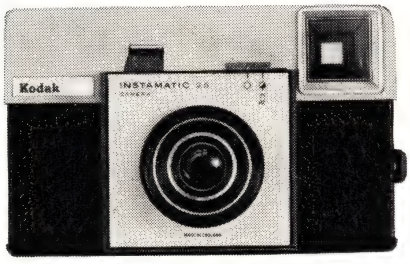
All prices post free from **10 Bouverie Street, London, EC4.**



On your marks



get set



go!

Loading an Instamatic camera could be the only race you'll ever win in just 3 seconds.

Here's how.

Take an Instamatic camera. (The one in the picture only costs 53/1.) And take a Kodak film cartridge.

Open one, drop in the other, close, wind on, and start shooting pictures.

Great pictures. Colour or black-and-white.

While you're doing this, you may see some people who don't have Instamatic cameras.

They'll all be fiddling away in dark corners, threading film, going very bad-tempered. Pity them. After all, 3 seconds is hard to beat.

Kodak Instamatic cameras...picture-taking made beautifully simple

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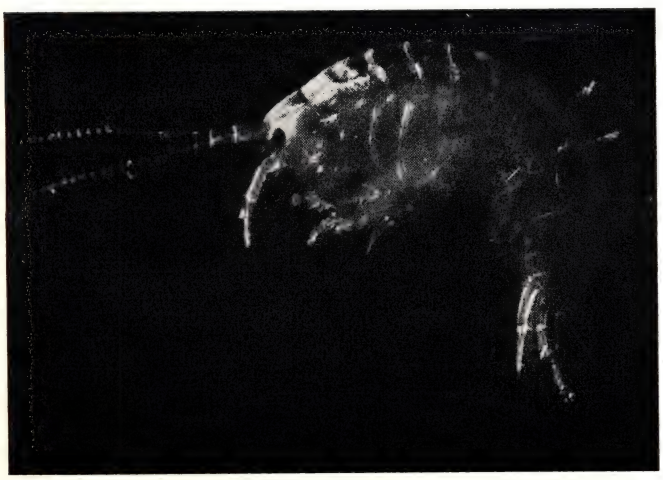
Eirlys Gilbert writes about the swallows, voles, leeches and beetles of a disused town canal. Even the brown rat (right: photo by Jane Burton) proves an attractive animal if you are interested in it. Freshwater shrimps (below: photo by L. Geiger-Bildpost) were found embedded in a lump of canal ice. Can they survive freezing? This is one of the many questions about the wildlife of its canal (a "cut" to working boatmen) which the Retford Girls' High School has still to find out.

Fishing in the cut

LAST YEAR our group of Wildlife Rangers, mostly thirteen-year-olds, decided to have a close look at the disused Chesterfield Canal on the school boundary. None of us had much idea of what lived there, except tadpoles. and so it was decided to carry out a survey of a four-hundred-yard stretch of canal.

We started last January and officially ended in July, but once the survey was started we quickly grasped its possibilities. But our time, alas, was limited and its prime object, we decided, was to assess the usefulness of the canal as a nature reserve.

The material we found shows what the enthusiasm and perseverance of young rangers can do. The roles of teacher and pupil were soon reversed, for they collected and observed so energetically that *they* soon swamped me with information which I had to assimilate!



To keep the canal under fairly constant scrutiny it was necessary to divide up into teams of four, taking turns to explore the banks, noting everything of interest and making routine observations such as the maximum and minimum air and water temperatures.

Fishing was done mostly with home-made equipment. The familiar plastic covered coat hangers were converted into dipping nets with nylon stocking tops. By inserting these into canes we made long-handled nets. Cheap, light coloured plastic washing up bowls made excellent collecting dishes. Discarded jelly dishes and small plastic cheese-spread containers were used to sort the catch in the laboratory. They also served as breeding dishes to see what would hatch out from the various kinds of egg masses collected.

We found that the canal at this point is shallow: no more than two feet deep in the middle. On the school side, pond sedge and great water grass *Glyceria* have encroached well into the water and are backed by clumps of meadowsweet. great willowherb and reed grass *Phalaris*. This is brightened by the lovely yellow flag, while the towpath carries in its stone facings skullcap, water mint and gipsywort. Flanking the banks on both sides for about two hundred yards there are trees of willow, oak, horse chestnut and elder. Beyond these some houses and a small factory stand close to the waterside.

cygnets and water voles

WELL into February two buff-coloured cygnets stayed near the houses relying on household scraps. Several times in broad daylight a brown rat ran across the frozen canal and grabbed bread from under the beaks of the hissing cygnets.

A few yards away a solitary apple tree of unknown parentage had dropped its heavy crop of small sour fruit onto the bank. This supported a large colony of water voles through

Water voles (this one is under water photo by Geoffrey Kinns) can often be watched by scattering a few pieces of sweet apple near their holes, and sitting very quietly on the opposite bank of the river or canal.

the winter months. Every day their feeding platforms were littered with freshly chewed pieces of apple. Plaster casts were taken of their tracks and in March a live-trap baited with sweet apple caught a glossy male. He didn't panic but looked at us quite calmly before waddling off into the undergrowth. The burrows here are closely packed with only eighteen inches to two feet between them. One deep burrow, perhaps that of a brown rat, had remains of birds and half eaten frogs in it.

martins and mayflies

THE moorhens who visited us were too suspicious to nest, but nests of other birds were found near the bank: thrush, blackbird, hedge sparrow and wren. House sparrows, swallows and martins built in the school buildings and in cracks in the canal bridge. In addition to these it was evident that many other birds depended on canal-bred insects to rear their families. Robins, chaffinches, sedge warblers and occasionally willow warblers were seen at the water's edge with packed beaks. Blue tits and great tits took insects from the overhanging trees. In May and June when swallows and house martins skimmed the surface they were often imitated by house sparrows. We could hear their snapping beaks quite clearly as they plunged hit-and-miss fashion after mayflies.

From the start the bed of the canal was covered with tangled hairs of the alga *Rhizoclonium*, a blanket weed, holding a dense population of water hoglouse *Asellus*. By late July part of the surface was choked by *Enteromorpha*, a pale green tube-alga forming mats firm enough to support birds in search of food. (The Botany Department of Durham University helped us to identify the algae). Flowering water weeds became more plentiful as the water grew warmer, and to our lists we added Canadian pondweed, two species of water crowfoot, milfoil, hornwort, water starwort, water bistort and three species of *Potamogeton* pondweeds.

But the water creatures held our attention longest. January and February were disappointing. We saw only water hoglice *Asellus*, freshwater shrimps *Gammarus* and small water boatmen. A lump of muddy ice left melting in the laboratory contained some freshwater shrimps, lively specimens too. Another winter we mean to check this observation. Can these creatures survive freezing?

In March lots of little round dark "seeds" were found in the *Rhizoclonium*. These puzzled us until one girl noticed a white flatworm *Dendrocoelum* laying some bright orange eggs which darkened in a few days and were found to be identical with the black "seeds". These took three weeks to hatch.

leech-lovers and beetle-fanciers

SOME of us became dedicated leech collectors, for these animals either fascinate or horrify. Seven of the eleven British species were found in our stretch of canal. The horse leech and an eight-eyed leech were the most plentiful, and the rarest was the beautiful greenish *Piscicola*, a fish parasite.

The numerous insects and their larvae are, of course, a job for the specialist. But by commandeering every relevant book from the school library we made great efforts to label at least the caddis fly larvae. Some of these pupated and

hatched in the laboratory, so we were able to match up the adults to the larvae. Although the great water beetle *Dytiscus* was never found, six other beetles were plentiful. The favourite was a black and yellow *Deronectes* found eating water hoglice. (Dr J. C. Hartley of Nottingham University helped us with the beetles).

By June plump red water mites were very evident. Their closely packed eggs looked like rubber sheaths on the stems of water crowfoot, and three weeks later the thickly hatching larvae formed patches of red dust on the surface of the canal. A great deal of sympathy was given to the small water boatmen and water skaters found parasitised by the young mites. Tweezers were always at hand to operate!

Speaking of bugs, five kinds were found. The most closely studied was the water scorpion *Nepa*. One specimen in the laboratory obligingly laid twenty-one eggs, little cream coloured ovals with a tuft of hair-like appendages at one end. Some of these hatched after three weeks and the last one surprisingly over ten days later.

shells from supply streams?

SIXTEEN species of molluscs were identified, although some by shell only. Of the living specimens, wandering snail *Limnaea pereger* was the most prolific, followed by common *Bithynia*. We saw a few specimens of Jenkins' spire snail, interesting because it is said to have adapted itself from brackish to fresh water comparatively recently. Ramshorn snail *Planorbis planorbis* dominated the decaying grassy vegetation. The pretty speckled *Nerite* valve snails and the river snail *Viviparus* were represented by empty shells only, suggesting that they had perhaps been carried into the canal by supply streams.

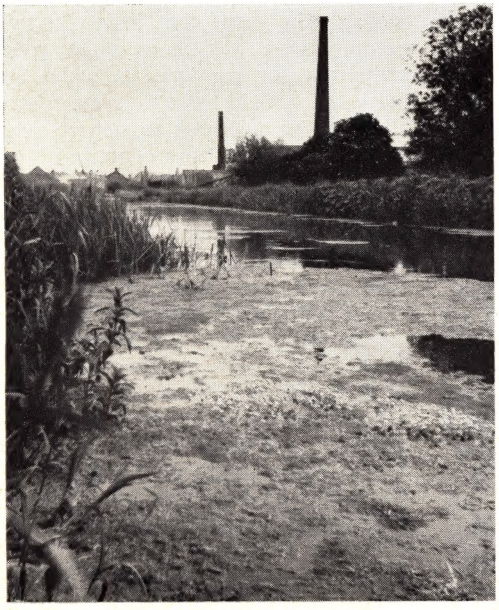
We suspect that the fish population is more varied than our lists show. Those actually seen or caught were minnow, stone loach, perch, pike and roach. In July about a dozen roach were seen floating on the surface, and similar reports have come from other stretches of water in this area. The cause of death is being investigated by the Trent River Board; latest reports indicate that the disease is the notorious *Columnaris*, called the 'red death' because it leaves red blotches on the fish.

There was one creature that always made us forget our routine duties: the tadpole. We loved them all. The parents, mostly toads last year, were first seen in the middle of April. One pair laid a string of eggs in the laboratory—we estimated 1400. Their development was followed closely, and when at last the adult toads grew restless they were most regretfully returned to the canal. In mid-July a mass migration of tiny toads took place, and some were found as far as fifty yards from the water.

Altogether we identified sixty-three invertebrate animals living most or all of their lives in water, and twenty-two vertebrates. This included the birds and other creatures which depend almost entirely on the food provided by the canal. There are probably others we have missed and certainly many we have been unable to name. Thirty-six species of water or waterside plants were noted, nearly all of them graceful or colourful.

If our disused canals are drained and filled in, most of these species will dwindle or disappear. In an intensively cultivated countryside most natural ponds and marshes have already gone.

The photos below show (left) the Chesterfield Canal on the edge of Retford, with water crowfoot in flower, and (right) girls fishing from the towpath below a lock. Photos by E. G. Gilbert.



John Cannon writes about the lichens which festoon the branches of trees in damp parts of Britain, and about the flowering plants which grow in the crowns of pollarded willows and the crevices of walls.

Epiphytes

MANY PEOPLE with only a slight knowledge of natural history know that trees in the moister parts of the tropics often have other plants growing on them. Many of these *epiphytic* species, to use the correct botanical term, find a place in our greenhouses, and include most of the spectacular orchids that are to be seen in florists. The shade cast by the canopy of many tropical forests is very dense, and by growing up on the branches the epiphytes are able to receive more of the sunlight that they need for their growth. Only a few species of specialised types can survive in the deep shade on the ground.

The epiphytes, unlike the *parasites*, do not get any food from the plants on which they are growing. This distinction should be carefully noted, as it is often a source of confusion.

Even people who are quite well informed on natural history matters frequently do not realise that the epiphytic habit is frequently developed among the plants of our own country. In our case, however, the plants concerned are not specially adapted to this habitat, as many of the tropical species are, but are merely colonising all the available niches that are capable of supporting plant growth. In many instances they are familiar hedgerow species.

In the wetter parts of the country, such as Dartmoor and western Scotland, you will often see trees festooned with mosses, liverworts and lichens. These plants are epiphytes, within the terms of the scientific definition, but to include discussion of these groups would extend this article beyond reasonable limits. You will also notice several species of higher plants, such as rowan, or mountain ash, bilberry and the polypody fern, growing out from crevices in the bark and from the crooks of branches. You may wonder how they can survive without any soil or normal water supply. The answer lies in decayed remains of mosses and lichens, together with particles of windblown dust that collect in the crevices of the bark. These provide sufficient mineral nutrients for the growth of the epiphytes, while the mats of moss and lichens soak up enough water in these moister parts of the country to allow the higher plants growing among them to survive. Wistman's Wood, a small wood of dwarf oaks on a boulder-strewn slope in central Dartmoor, provides a wonderful and classic example of epiphytes growing luxuriously under British conditions.

along the rivers

ONLY a few of the readers of this article will have ready access to the wilder and wetter parts of this country, although very large numbers visit these areas on holiday. Many other people will, however, have another type of epiphytic habitat close to their homes. This is in the crowns of the *pollarded* willows that are often planted in rows along the banks of our lowland rivers.

Pollarding is a system of forestry management in which the branches of the trees are cut off right back to the main trunk at regular intervals. The crop of branches is used for stakes and poles, and in due course a new crop grows from the top of the trunk. As a result of this procedure, a low tree with a dense symmetrical mass of branches, all arising from approximately the same level, is formed. They look very like the conventional sign for deciduous woodland used on Ordnance Survey maps.

In an old pollarded tree there is a shallow saucer-like depression at the top of the trunk, between the branches. When the leaves fall in autumn, many of them collect here, and as they gradually rot down, accompanied by the remains of birds' nests, windblown dust and other materials, a fertile soil is built up, rather like a woodland leaf mould. Any seeds that arrive in this natural 'seed box' have quite good conditions for germination, while the mass of mould which accumulates allows these epiphytes to survive even in the drier parts of our country.

My wife and I have made some studies on the epiphytic plants growing in the willows along the banks of the river Stour, near Flatford Mill Field Centre in Suffolk. We were interested in the answers to three problems. Firstly, what species were present? Secondly, which were the commonest? Thirdly, did the plants survive in this unusual position for a long time? In order to answer these questions, we looked at the plants growing in one hundred willows, once a year, for five years.

We found that the species present

ranged from the seedlings of trees like oak and ash, through common roadside herbs, to blackcurrants and gooseberries from cottage gardens. The trees, of course, could not reach maturity in this habitat, but most of the other species flowered and produced seeds quite happily. In all, thirty-five species were recorded from the hundred willows during the five years of study.

by wind and birds

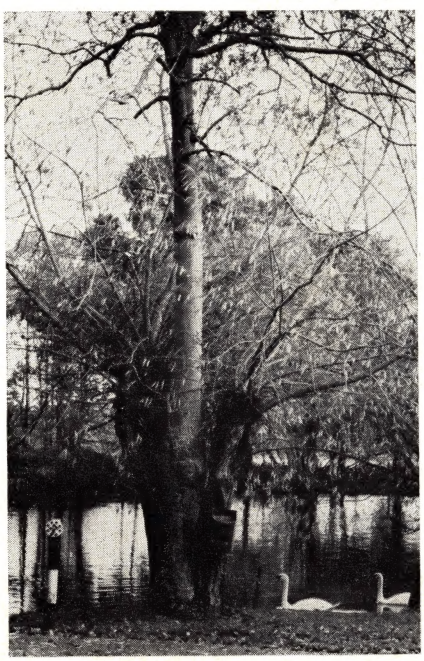
THE commonest plants we found were goosegrass *Galium aparine*, dog rose, hawthorn, bramble, dandelion and annual meadow grass *Poa annua*. Between 28% and 41% of the trees had goosegrass every year, and always at least half the willows carried epiphytes of some species. Our original records, which list the epiphytes tree by tree, shows that over the years the community of plants in each tree was remarkably stable. Just as on the ground a small area of woodland always carries more or less the same species, so the same plants are present in the crown of a willow year after year.

Broadly speaking there are two main ways in which seeds reach the willow crowns: by wind and by the action of animals (including birds). A glance at the list of species present reminds one that several of them have a parachute mechanism on their fruit, or else have very light fruit: e.g. dandelion and sowthistle. Many others, such as blackberry, elder and hawthorn, have an edible fruit that is attractive to birds. Goosegrass, which we always found to be the most frequent epiphyte, appears to be frequently incorporated in birds' nests, and this is probably an important factor in enabling it to reach willow crowns, although it does of course possess fruit covered with fine spines, so that they may become attached to the bodies of mammals and birds.

It is usually very difficult to discover how effective a plant's apparent means of dispersal really is in nature. What appear to us to be efficient dispersal mechanisms do not always seem to work out that way under natural conditions. Consequently we were particularly pleased to be able to record at least one clear case of dispersal over a known distance. In 1950, a crop of buckwheat was grown in a field about half a mile from the willow in which we found buckwheat as an epiphyte in 1951. It was not grown in any other field in the district, and it seems almost certain that it was carried to the tree in one stage of half a mile by a bird. Wood pigeons and pheasants are known to enjoy these seeds and both species frequent the willows.

I hope that this short article will have suggested to you the interest of looking at epiphytes. The spring and early summer are the best times, so why not have a look yourself? But you may live in a town, a long way from the willows that flank many of our rivers. If this is the case, then take a careful look at any old trees in gardens or along roads. Many local authorities pollard trees such as poplars or planes, and epiphytic plants are not rare, even near the centre of cities. Alternatively, I recommend you to make a note of all the plants that you see growing on old walls. The conditions under which these plants live are very like those of the true epiphytic habitat.

Lichens (opposite page: photo by Jane Burton) are found hanging from trees in wet climates: these are on a Dartmoor hawthorn. The pollarded willow below (photo by Raymond Lea) attracted an ash seedling which finally split the willow's trunk in two. More pollarded willows are shown on the back cover.



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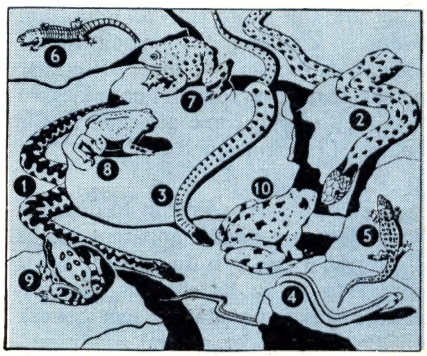
Pollarded willows along the river Wylye near Norton Bavant. After reading John Cannon's article (page 22) search for epiphytic *plants growing in the crowns of pollarded trees, and in the crevices of old stone and brick walls. There are a surprising number.* *Photo by Geoffrey N. Wright from* The Countryman.

This month's cover



Our reptiles are harmless except for the ADDER (1), distinguished by a usually strong zig-zag. So don't kill the GRASS SNAKE (2)—look for the yellow round its neck—or the rare SMOOTH SNAKE (3) of sandy heaths in Hampshire and elsewhere; or the dry, glistening SLOW WORM (4), no snake at all but a legless lizard. The other British lizards are the uncommon SAND LIZARD (5), also liking sandy heaths (the male goes green as a lettuce in spring), and the common VIVIPAROUS LIZARD (6)—viviparous, because it produces its young alive, whereas Slow Worm and Sand Lizard lay eggs.

Our amphibians are also harmless, notably the toads, the COMMON TOAD or PADDOCK (7) for all its reputation, and the NATTERJACK (8)—the name means "Poison Jack"—which cannot hop and has a pale stripe down its back. The three frogs in Britain are the COMMON FROG (9) and two noisy introduced kinds, the large MARSH FROG (10), which choruses in Romney Marsh, and the Edible Frog of which there are colonies near London. Note that all these creatures vary individually in colour and markings.

Described by Geoffrey Grigson and painted by Tristram Hillier.
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